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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/724,954

12/01/2003

Ryosuke Usui

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7590

01/05/2005

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EXAMINER

BREWSTER, WILLIAM M

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 01/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/724,954

Applicant(s)

USUI ET AL.

Examiner

William M. Brewster

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2004.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-13 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 1 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

Figures 10 and 11 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Huang et al., US Patent No. 6,083,775.

Huang anticipates a circuit device manufacturing method comprising:
In fig. 7, forming separation groove in a conductive foil, foil formed delineated by the 4 cross-hairs and also the leads on the periphery of the cross hairs where the separation

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grooves are at the boundaries of the foil and wherein the contiguous foil is integrally connected at the bottom between the separation grooves, from a top surface to form conductive pattern that are integrally connected at the bottom portion of the conductive foil;

in fig. 8, mounting circuit element, chip, step 101, onto desired location of the conductive pattern;

in step 103, irradiating plasma onto the top surface of the conductive foil, including the circuit element; and

in step 105, sealing with a resin layer so as to cover the circuit element and fill the separation groove,

wherein plasma is irradiated onto the top surface of the conductive foil, col. 1, lines 54-67;

limitations from claim 3, the method, in fig. 6, wherein irradiation of the plasma is carried out prior to the step of mounting the circuit element, steps 603/605, col. 5, lines 4-65;

limitations from claim 4, the method, in fig. 8, wherein irradiation of the plasma is carried out subsequent the step of mounting the circuit element, steps 101, 103, col. 5, lines 4-65;

limitations from claim 5, the method, wherein contaminants attached to the surfaces of the separation groove are removed by the plasma, col. 5, lines 42-53;

limitations from claim 12, the method, in fig. 6, wherein the circuit element is semiconductor element that is electrically connected via metal wires 604, col. 5, lines 54-65.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6-9, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang as applied to claims 1-5, 12 above, and further in view of Abys et al., US Patent No. 5,675,177.

Huang does not teach the use of oxygen gas in the plasma irradiation, but Abys does. Abys teaches in fig. 1 forming a conductive foil 10 with grooves at the boundaries, attaching an IC component 11,

limitations from claim 6, the method, wherein the contaminants comprise organic or inorganic matter, col. 5, lines 66 - col. 6, lines 14;

limitations from claim 7, the method, wherein the surface of the separation groove is roughened by the plasma irradiation, the adding of oxide, col. 5, lines 66 - col. 6, lines 14;

limitations from claim 8, the method, wherein the surface of the separation groove is oxidized by the plasma irradiation, all the surfaces of the conductive foil, col. 5, lines 66 - col. 6, lines 14;

limitations from claim 9, the method, wherein the plasma irradiation is carried out using oxygen gas, col. 5, lines 66 - col. 6, lines 14;

limitations from claim 11, in figs. 2, 3, the method, wherein the conductive foil is formed of a metal having copper 20 as the principal material, col. 3, lines 26-36.

Abys gives motivation on col. 5, lines 55-65. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Abys's invention with Huang's invention would have been beneficial because it produces reliable connections between IC and mounting board.

Claim 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang as applied to claims 1-5, 12 above, and further in view of Holden, US Patent No. 3,541,379.

Huang does not specify the use of an inert gas, but Holden does. Holden teaches the method wherein the plasma irradiation is carried out using an inert gas, such as argon, neon, or helium, col. 4, lines 34-46. Holden gives motivation on col. 2, line 54 - col. 3, line 3. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Holden's invention with Huang's invention would have been beneficial because the plasma can readily initiate in high and low gas flow rates and pressures.

Claim 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang as applied to claims 1-5, 12 above, and further in view of Applicant's Admitted Prior Art.

Huang does not specify the use of an eliminating the back surface of the foil, but the AAPA does. The AAPA teaches the method, in fig. 10C and D, wherein the rear surface of the conductive foil 100 is eliminated until the resin layer 101 exposes at the rear surface of the conductive foil to electrically separate the respective conductive pattern, p. 3, line 19 - p. 4, line 6. The AAPA gives motivation on p. 3, line 19 - p. 4, line 6. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining the AAPA's invention with Huang's invention would have been beneficial because it does not require a supporting substrate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William M. Brewster whose telephone number is 571-272-1854. The examiner can normally be reached on Full Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

William M. Brewster

30 December 2004
WB